UDLF: Buckets, Scalability, Interoperability, plus Process

K. Maly, M. Zubair, M. Nelson

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Motivation

- archival storage, with resource discovery, as a mechanism for reusing science course material across multiple course offerings, across faculty within a department, and across universities
- value of collaborative resource discovery as an important component of active learning

Vision

- Development of an Undergraduate Digital Library Framework (UDLF) and process for usage
- Flexible, extensible digital course objects with their own access protocol (buckets)
- Scalable reference implementation of distributed DL (NCSTRL+)
- Federation of existing digital libraries for students' resource discovery
- Simple web-based collaboration tools

Success will be knowing whether:

- digital libraries are effective in enhancing technology-delivered courses
- DLs enhance an active learning paradigm
- DLs are a proper vehicle to disseminate courses for reuse cost-effectively
- approach will scale to tens of thousands of objects and hundreds of concurrent users per university

What is in a UDLF (Undergraduate Digital Library Framework) Library?

- The project is collaboration of:
  - ODU digital library research group
  - Maryland Applied Information Technology Initiative at UoM
- The project DL will contain
  - sample courses and appropriate focus libraries drawn from the recommendations for IT education of Virginia and Maryland,
  - company certification courses, the PIs' own courses, annotations,
  - and students' portfolios at ODU

What is in a UDLF (Undergraduate Digital Library Framework) Library?

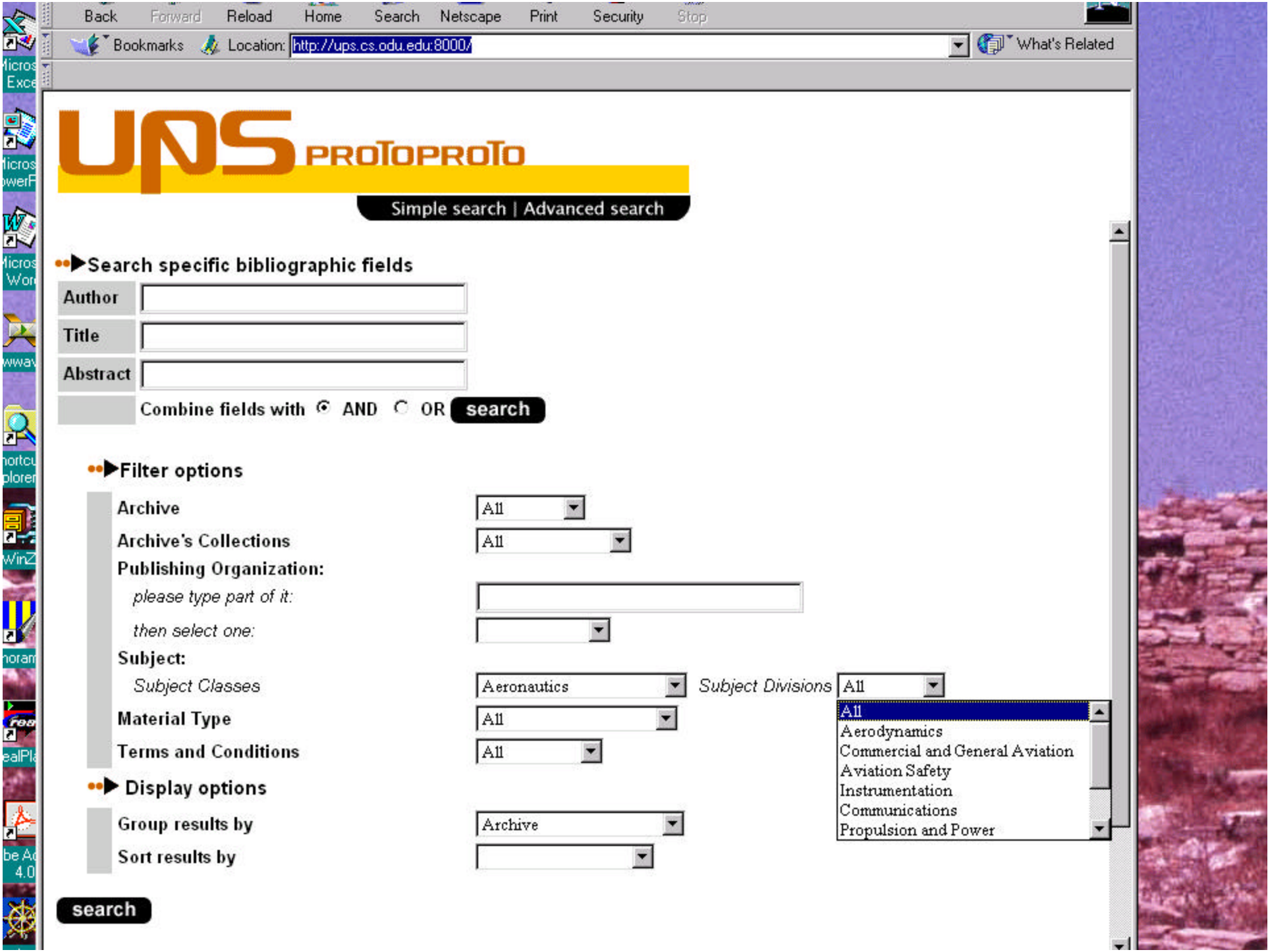
- Instructors can
  - archive and accessing course materials
  - instantiate, reuse, annotate existing courses
  - evolve courses through changes in content, structure and delivery mechanisms
  - create focused research libraries (drawn from other digital libraries, internet, faculty's personal collection)

What is in a UDLF (Undergraduate Digital Library Framework) Library?

- Students can
  - search, browse course material
  - maintain personal portfolios (projects, papers, resumes)
- Administrators & other accreditors can
  - annotate, browse, and evaluate course materials
- Recruiters can
  - review students' portfolios

NCSTRL+

- A joint research program between ODU and NASA LaRC to study the design and implementation of multi-discipline, multi-format digital libraries
- Uses the Dienst protocol, adding support for:
  - clusters, scalability, buckets, terms & conditions
- Family of tools to support digital objects' life cycle
  - search, creation, management, administration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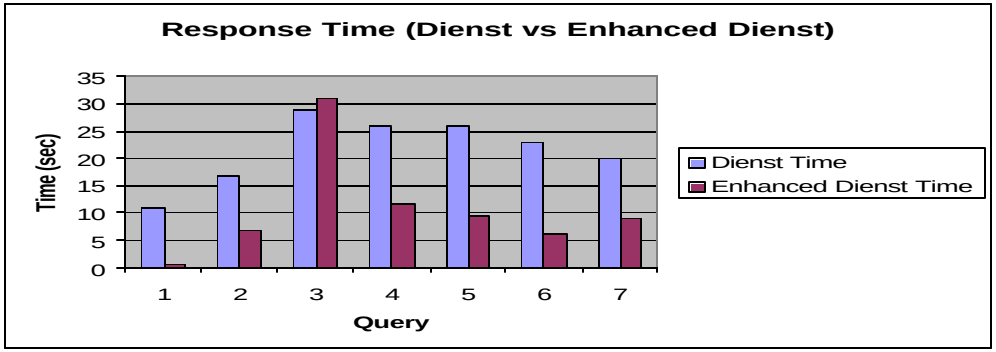
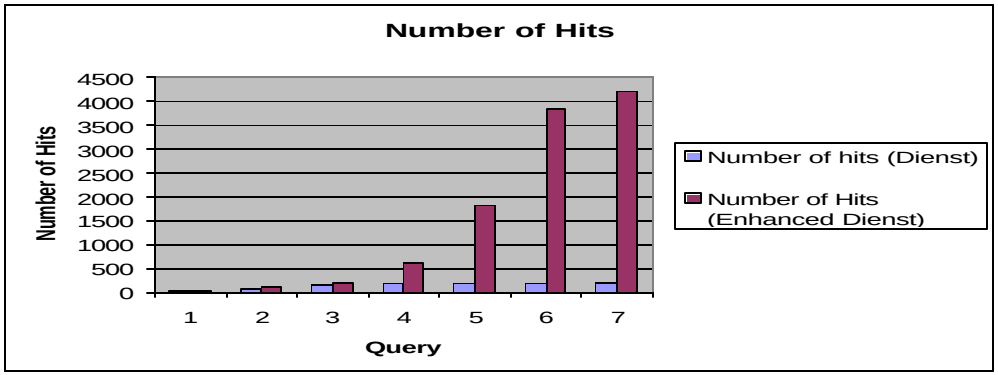


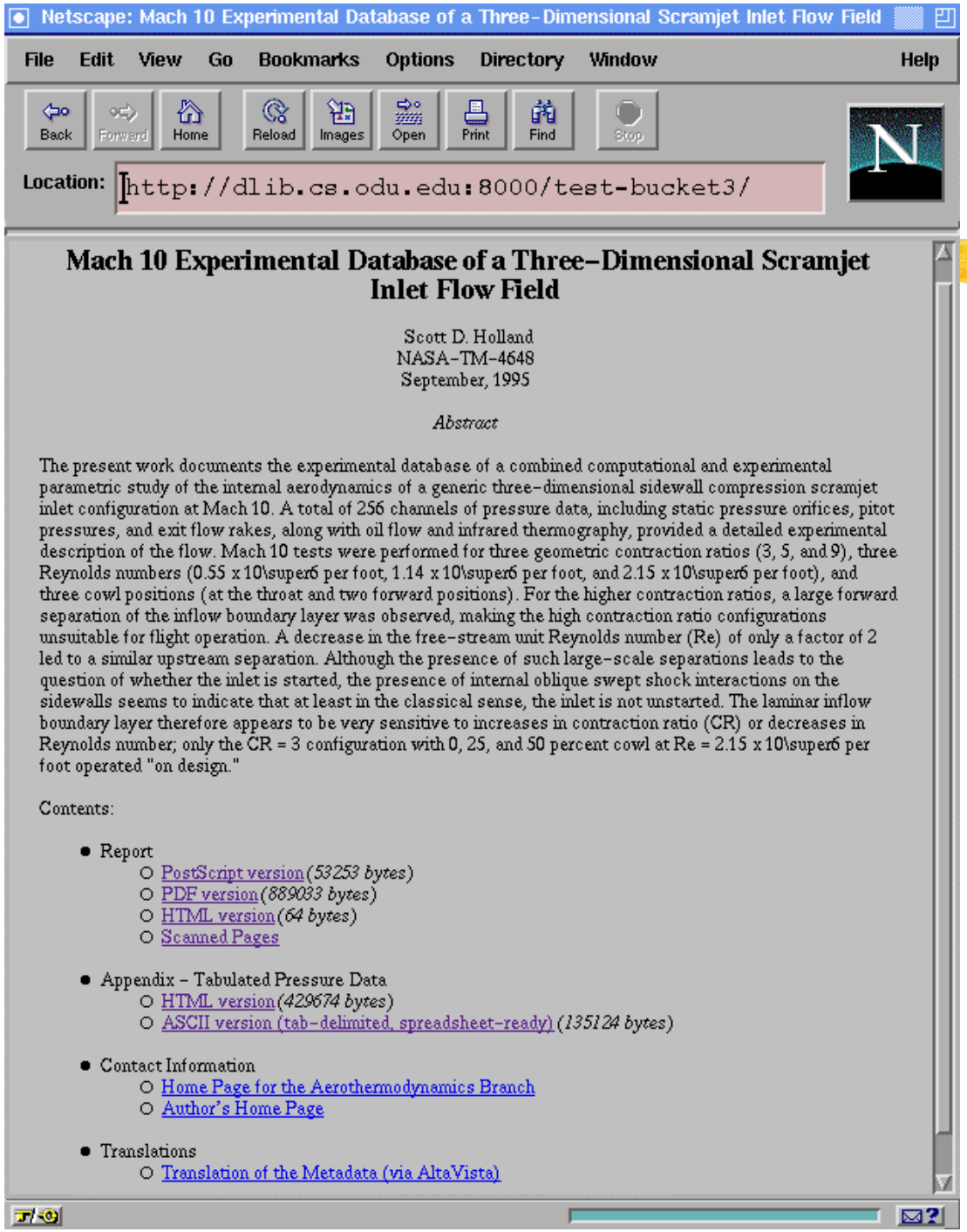


Buckets

- Collections of material in a variety of formats
- Programmable, intelligent, & customizable
  - contain mechanisms for display, security, etc.
- Portable
  - Buckets can be part of a library, but can also work in isolation

Phil the Bucket

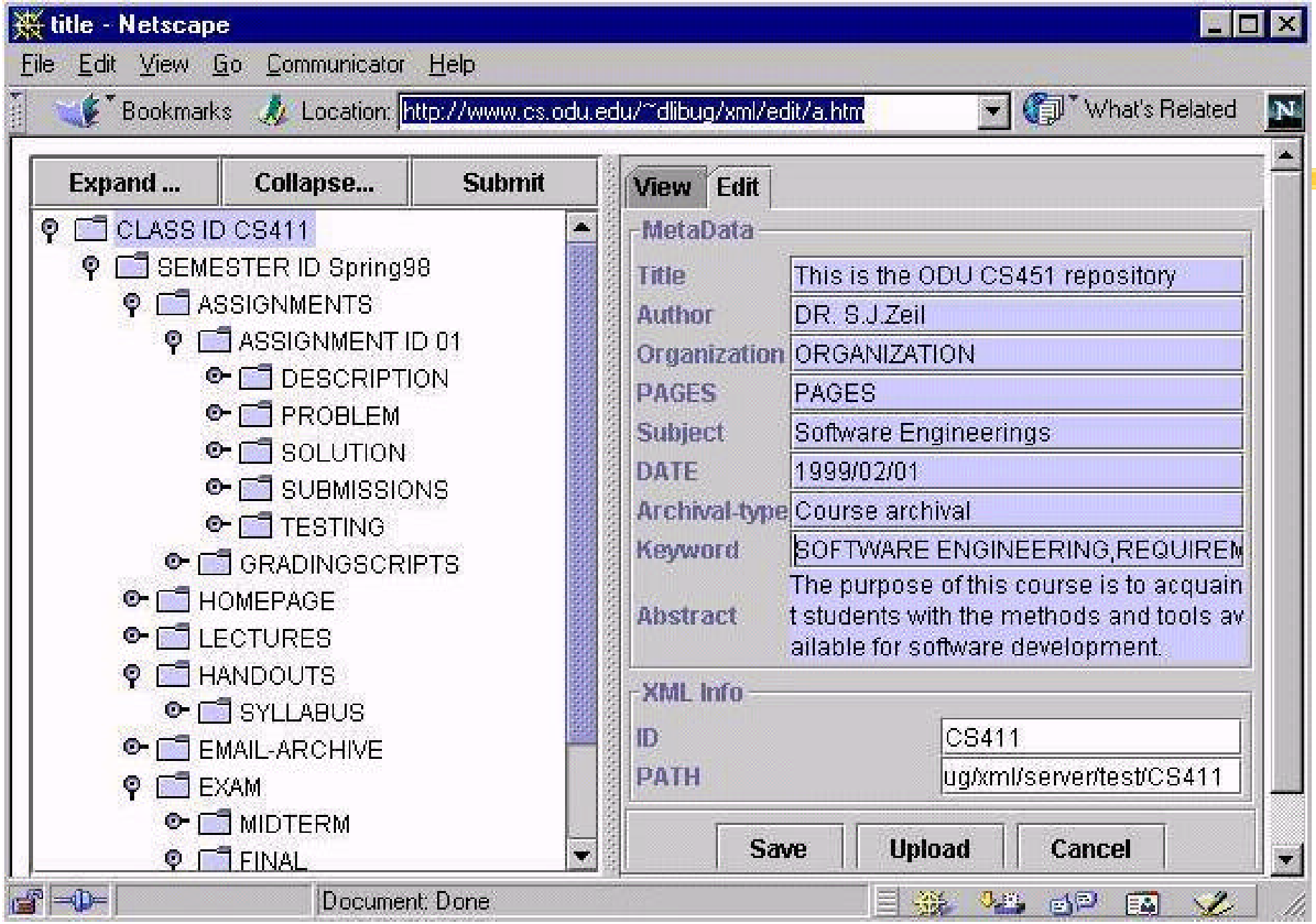
(all others are just pail imitations)



A Sample Bucket

4 packages:

- report (4 elements)
- appendix (2 elements)
- contact information (2 elements)
- translation (1 element)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Author DR. S.J.Zeil
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Subject Software Engineerings
DATE 1999/02/01
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Abstract The purpose of this course is to acquain t students with the methods and tools av ailable for software development.
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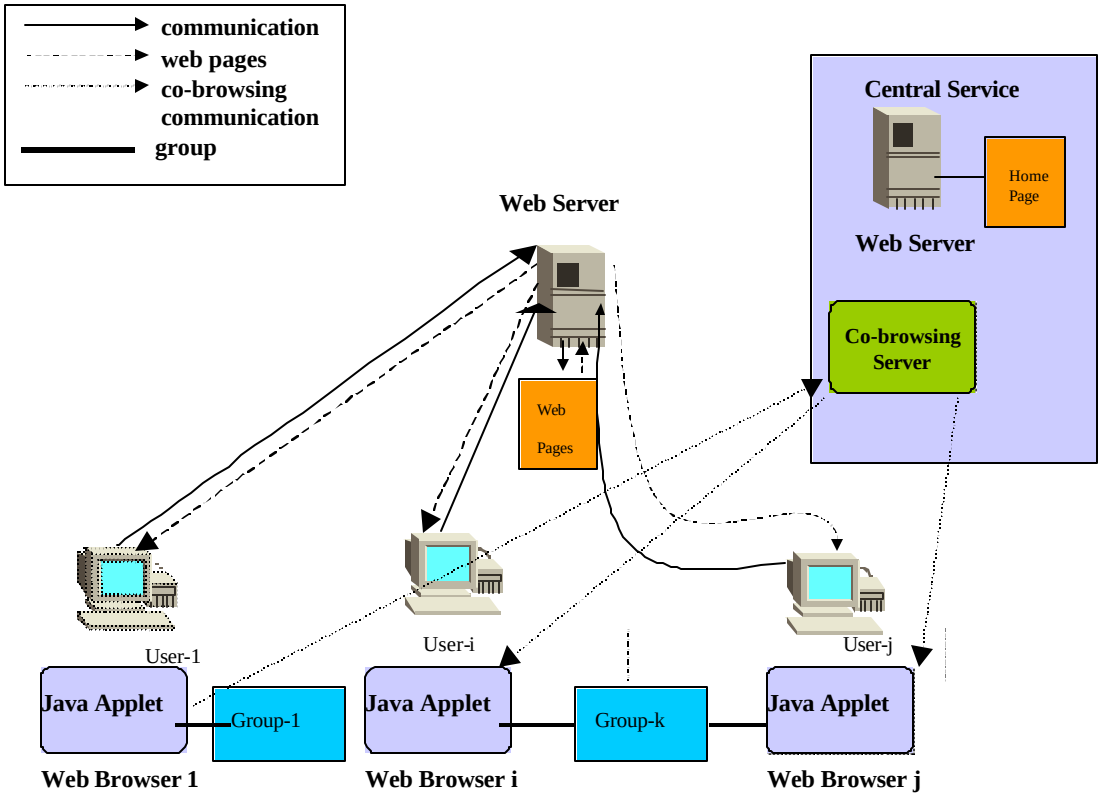
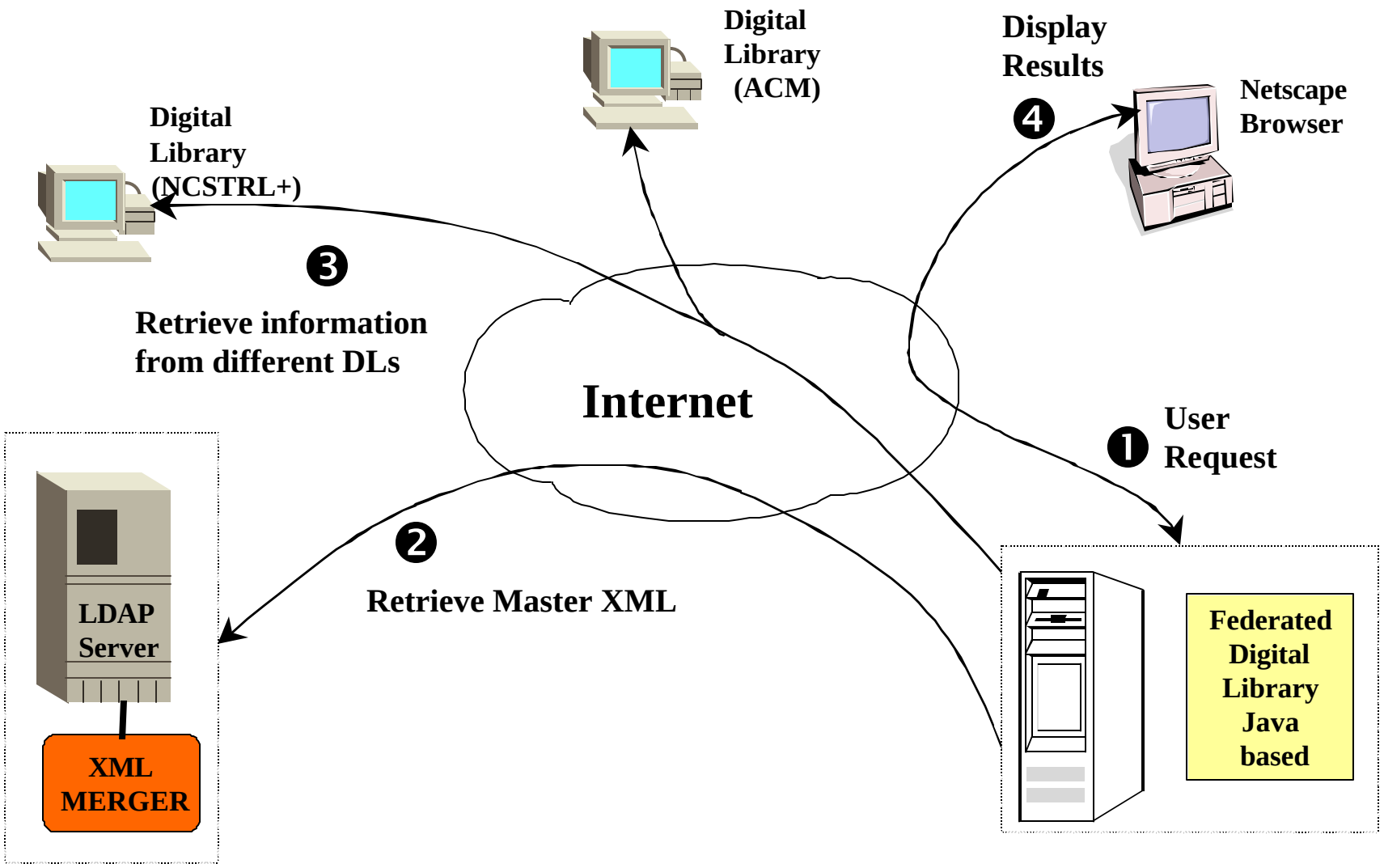
Collaboration tool - Cobrowsing



Interoperability Support

- Extensible Markup Language (XML) used to specify a digital library
- Digital library exposes its internal operation and access methods to the federated digital library through the XML specification
- XML specification independent from the federated digital library logic
- Existing digital libraries only need to describe their architecture and do not have to change it
- A new digital library is added by creating an XML specification for it

Accessing a Digital Library



Issues

- Search result presentation, navigation
- Conversion of existing course content
  - reference models, structural discovery & transformation
- Scalability in terms of number of users and objects
- Integrated support for entire process
- Technology completeness, link completeness
- Access roles, privacy, intellectual property rights
- Bucket intelligence

Demoes:

- XML-based bucket editor
- NCSTRL+ process support
  - search, security, and admin change
  - create bucket, management approval and publication
- Scalable implementation of OpenArchiveInitiative
- Federation of IEEE, NEEDS, ACM, NCSTRL+

Conclusions

- NCSTRL+ well suited for
  - learning
  - archive for reuse
- XML well suited for modelling buckets
- Students like portfolios
- Faculty love reuse (but will only contribute if easy)
- Administrators love persistency and availability

Reference

- http://dlib.cs.odu.edu/nsf/dlib2/udlfplan/
- http://dlib.cs.odu.edu